Request for Economic Stimulus Funds

Concept Proposal

Submitters (Name of Workgroup & Chair/Co-Chairs): **Murray State University:** K. Renee Fister, Department of Mathematics and Statistics and coordinator of NSF Biology and Mathematics in Population Studies grant; Terry Derting, Department of Biological Sciences; Judy Ratliff, Chair of Chemistry; John Crofton, Department of Engineering and Physics; Howard Whiteman, Director of Watershed Studies Institute; **NASA retired personnel:** Sue Darnell Ellis

Project Title: **Health and Education: What we can do for the future?**

Project Partners (Known or Anticipated):

Murray State University, University of Tennessee, Old Dominion University, Marymount University, CardiOption Company, Rocky Mountain Biological Laboratory, St. Jude Children's Hospital, NimBioS at University of Tennessee, Calloway County School system teachers and students

Project Background & Purpose (Justification for Project):

The concepts of health initiatives whether they are medical or economic requires advances in discoveries at the intersection of mathematics, biology, chemistry, physics, and economics. The need for persons to have the ability to discuss technical strategies in these disciplines and potentially more is vital in our future economies in relation to fuel dynamics, medical discoveries, and health initiatives from pediatrics to geriatrics. The focus of this proposal would be the incorporation of persons in academia and industry to collaborate on studies that kindergarten through high school students could benefit. The goal would be to increase the critical thinking ability of these students with the potential for activities for the younger children to grasp and for research collaborations for the older students with collegiate faculty and student teams that have industrial contacts. This also promotes the integration of research and teaching in all these fields by engaging students as both researchers and teachers. The students and faculty

can work together as research teams on integrative projects, asking innovative questions from multiple viewpoints.

Project Description (General Goals & Implementation Strategies):

A defining aspect of the project is the potential collaboration of four universities, an industrial company, a recently retired NASA education coordinator, and the local K-12 school systems. These mentors have the ability to attract a diverse group of students at all levels based on their different but complementary backgrounds. The teams of personnel have experience working with countless students in a research and development setting at the university level. **The impact of investing in students at the K-12 level has the potential to increase the skills of these students that will be required for the future.** As we foster these partnerships across the wide spectrum of K-12, university, industry, and laboratories, we have a unique opportunity to stimulate the growth of our future endeavors relating to fuel exploration, medical innovations, and implementation strategies for successful protocols of economic means to incorporate biomedical, environmental, and epidemiological changes from the interdisciplinary and interactive structure of these partnerships.

Needs and Goals:

- To understand the medical and economic implications of third hand smoke in connection to cancer and cardiac situations and disseminate information to school system and community with the expertise of University of Tennessee, Old Dominion University, CardiOption, Murray State University, and NASA colleague
- To mathematically model control strategies to effect change in fuel exploration with expertise from Marymount University, Murray State University, and NASA colleague
- To use knowledge developed from joint work with different subgroups of all of these organizations to involve students in research initiatives related to medical, environmental, and epidemiological problems. The goal is to increase the students' abilities and confidence and to develop an integrated workforce with more tools to transcend some of the problems that face us today.

Project Team (Project Manager(s), Content Experts, Instructional Designers, etc.):

Project Manager – K. Renee Fister

Content Experts – **Murray State University**: K. Renee Fister (Mathematics and Statistics), Terry Derting (Biological Sciences), Judy Ratliff (Chemistry), Howard Whiteman (Director of Watershed Studies Institute and Biological Sciences) with collaboration with **Rocky Mountain Biological Laboratory**, John Crofton (Engineering and Physics), Melissa Cooper (Specialist in Student Support Services)

University of Tennessee: Suzanne Lenhart (NimBioS Co-Director and Mathematics)

Old Dominion University: Holly Gaff (Epidemiological Modeler)

Marymount University: Elsa Schaefer (Optimization Specialist)

Sue Darnell Ellis, NASA, AESP, NEAT retired; KY Teacher in Space; Former NEAT Coordinator, NASA HQ, Johnson Space Center; Former AESP Director of Professional Development, NASA and OSU

Peco Products and CardioOption Company, industrial company that works on health related products

Project Budget & Amount of Economic Stimulus Funds Requested:

Yearly Preliminary Budget for each of three years

Activities for K-12:	$10,000
Laboratory and research supplies for students and mentors:	$25,000
Travel support for dissemination of work:	$15,000
Mentor resources (salary, support for collaborators)	$25,000
Fringe Benefits:	$ 8,000
Equipment for experimental studies:	$ 7,000
Total Requested from Stimulus Funds:	$90,000